



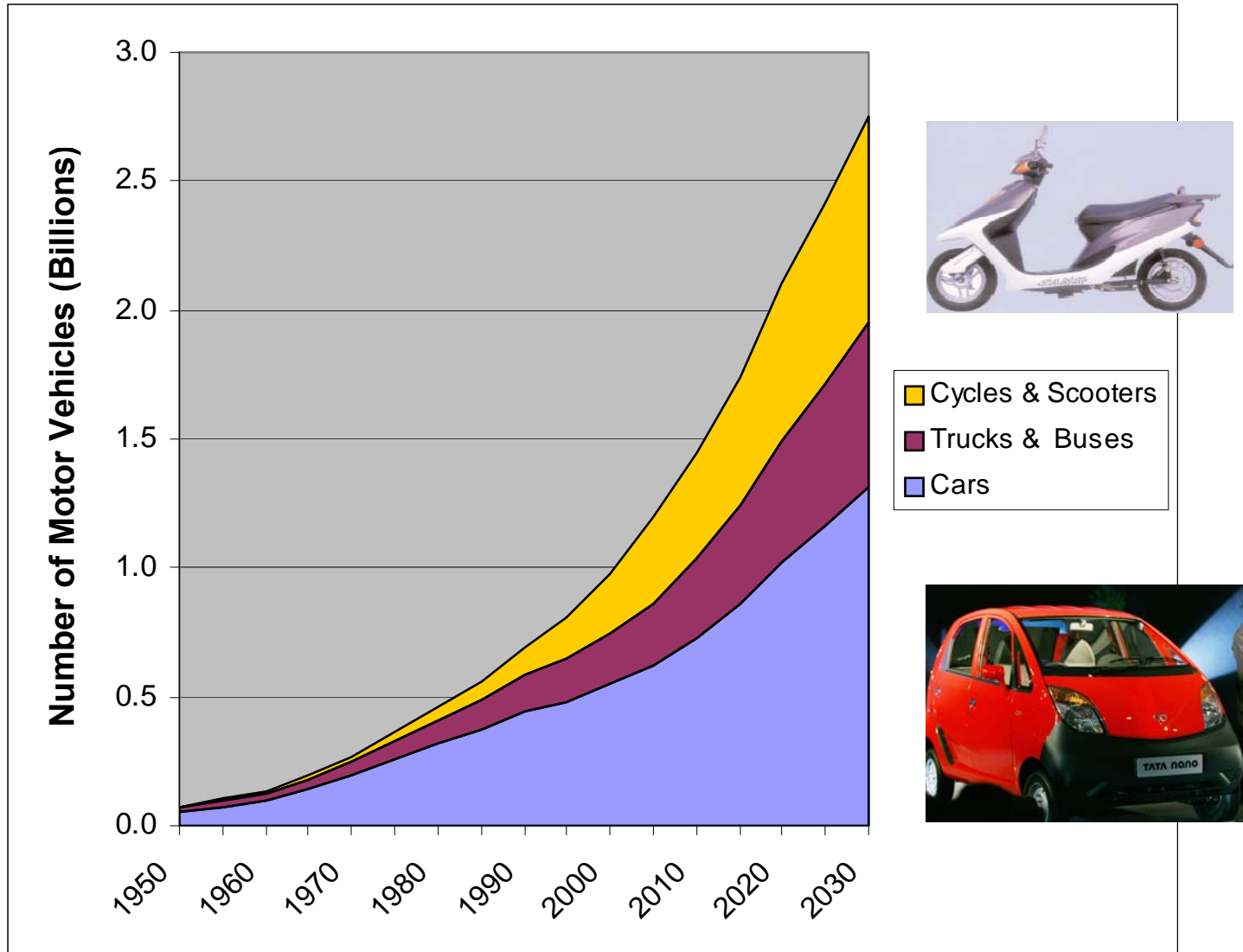
# *AB32 and Transformation of Transportation*

*... the theme is "change"!*

*Daniel Sperling  
UC Davis and CARB*

*5<sup>th</sup> Annual California Climate Change Conference  
September 8, 2008*

# 2 Billion Vehicles in 2020 (globally)!

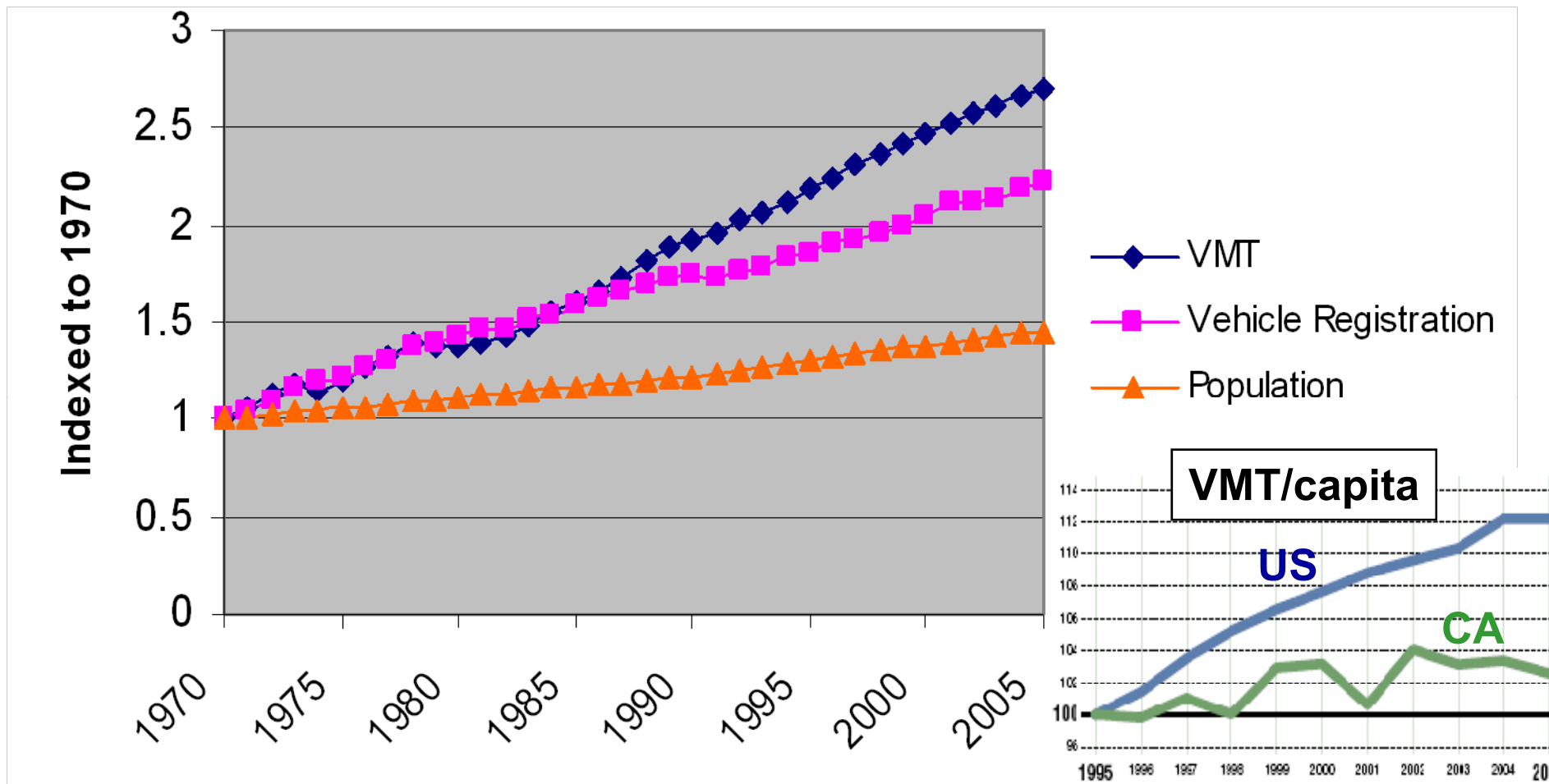


Sperling and Gordon (2009), based on DOE, JAMA, other





# Vehicle Travel Growing Faster than Population (but not in California?!)



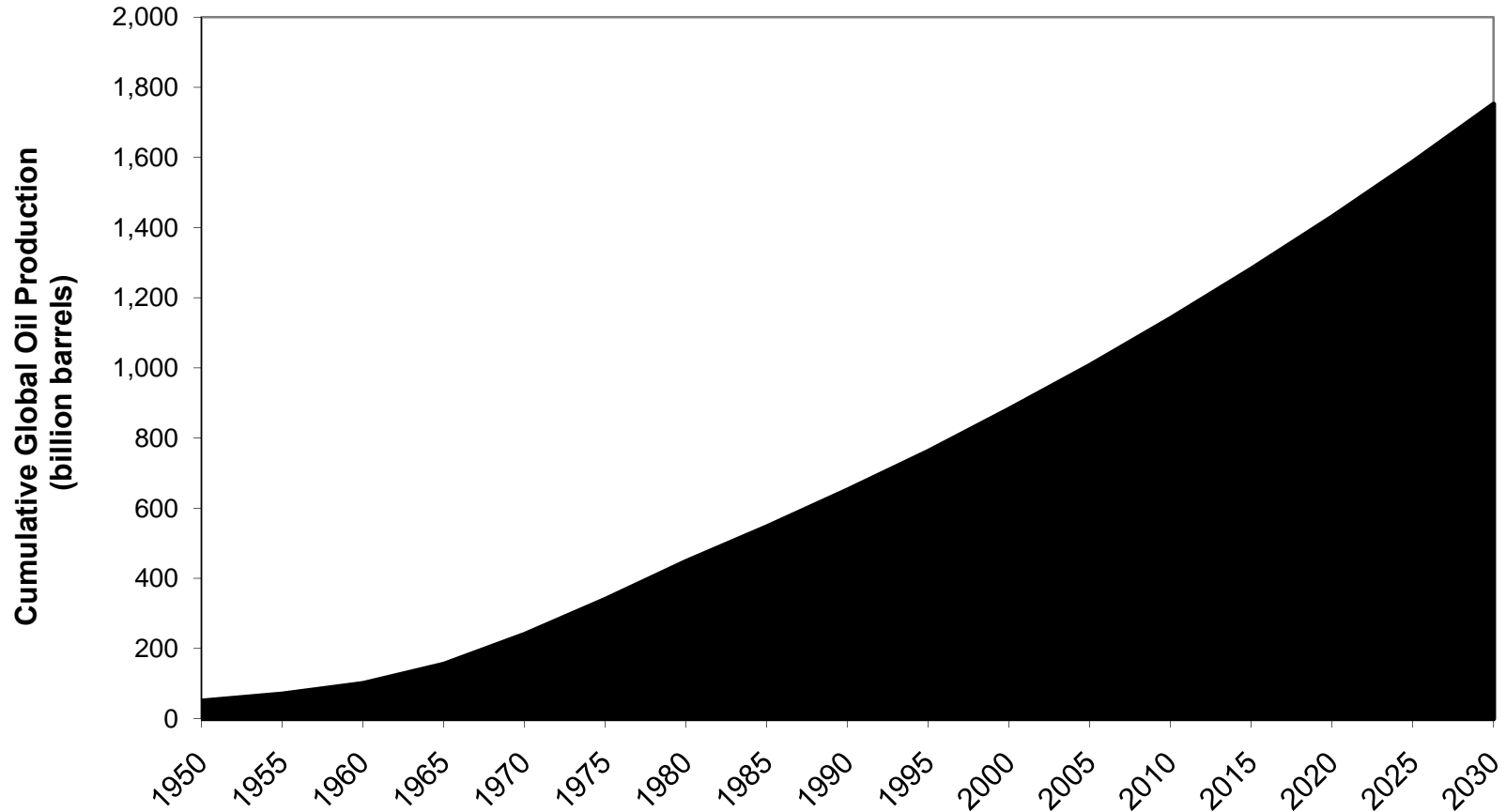
Source: ORNL, in Sperling and Gordon (2009)

Not all vehicle trips are “high value”!



**In the next 10 years, the world will consume 1/4  
of all the oil consumed through its entire history**

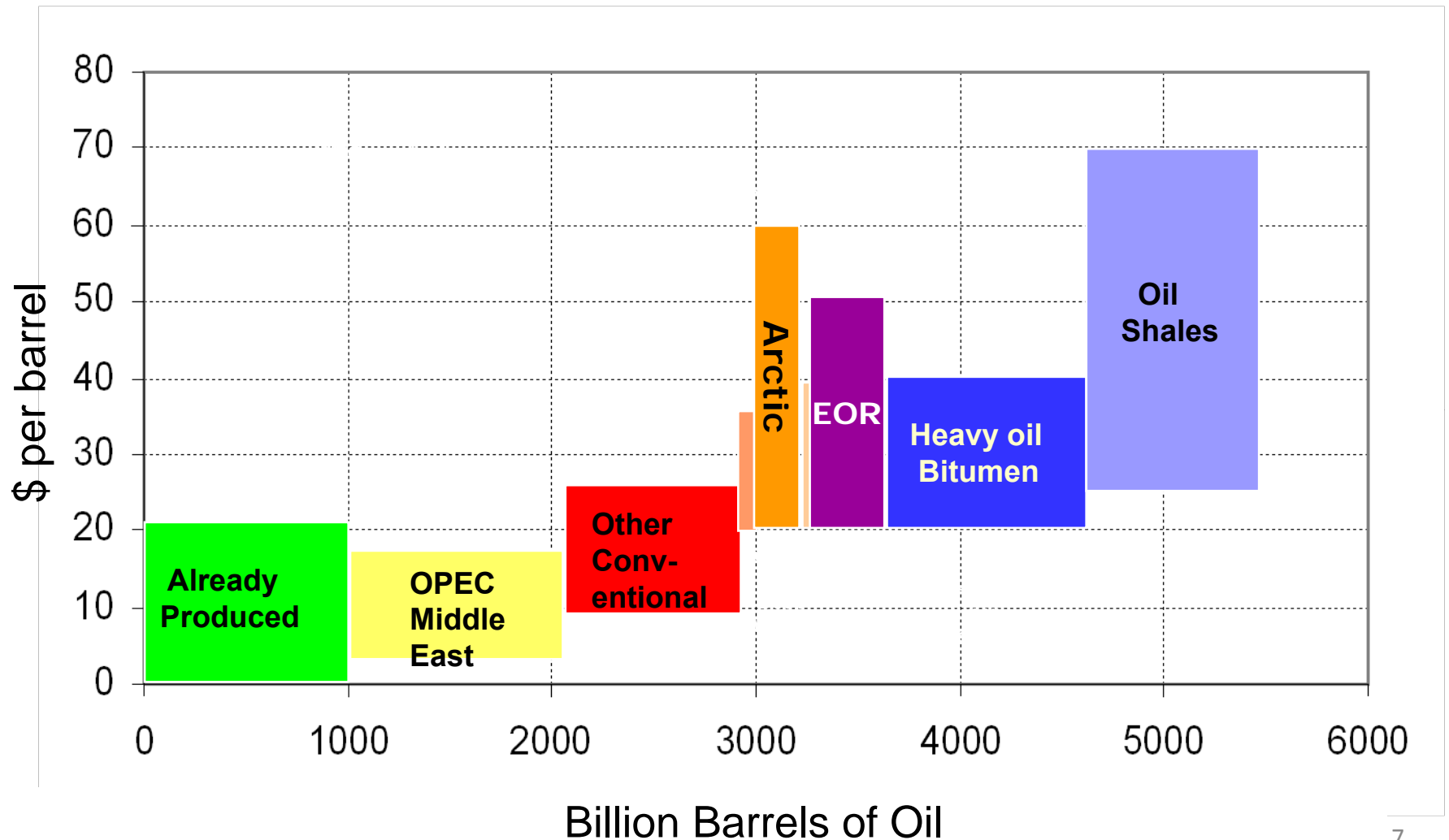
**Cumulative global oil production, 1950–2030**



Sources: Sperling and Gordon (2009), based on U.S. DOE/EIA data

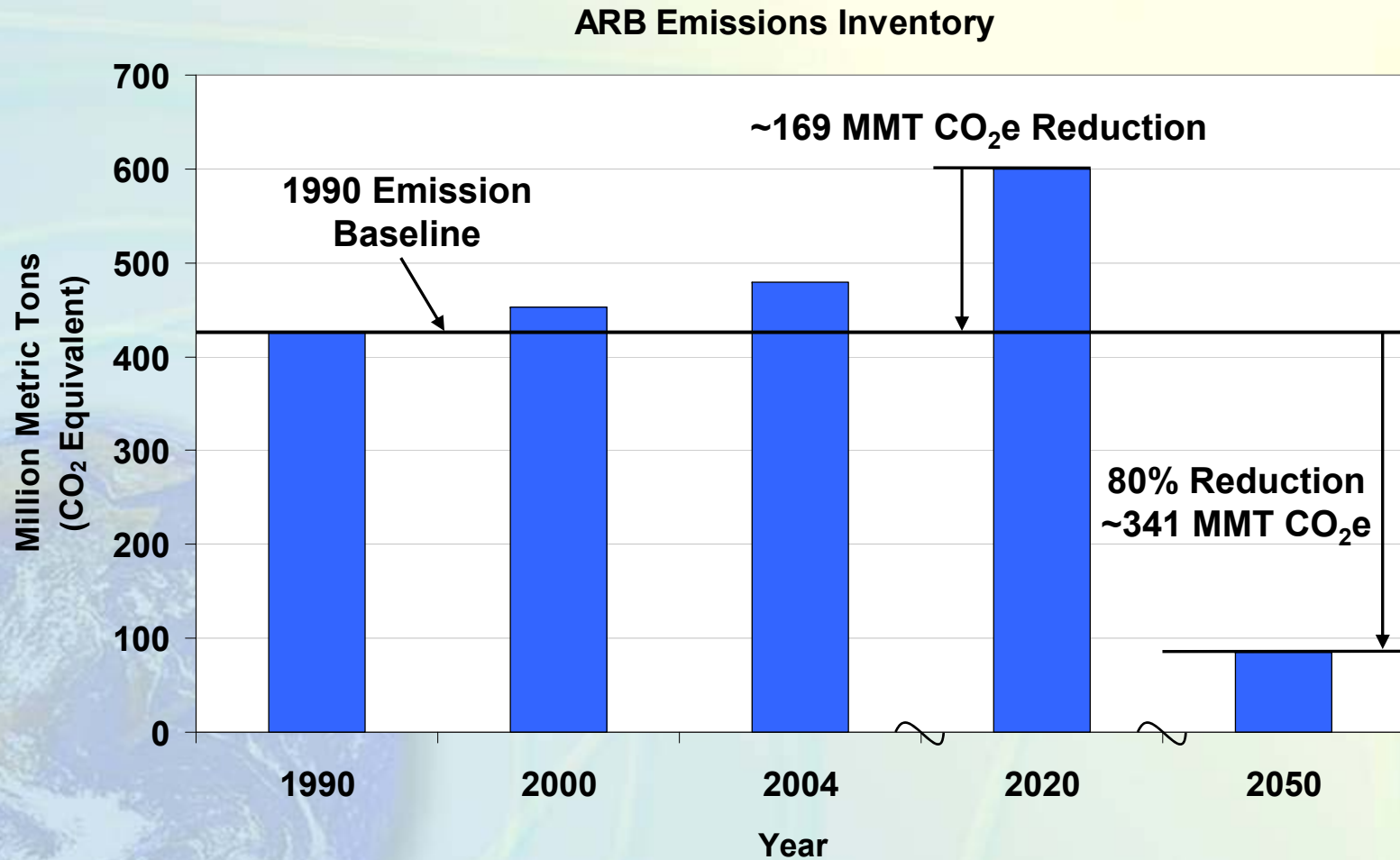
# An Increasing Share Will Be High-Carbon “Unconventional Oil”

Supply “Curve” of World Hydrocarbon Resources



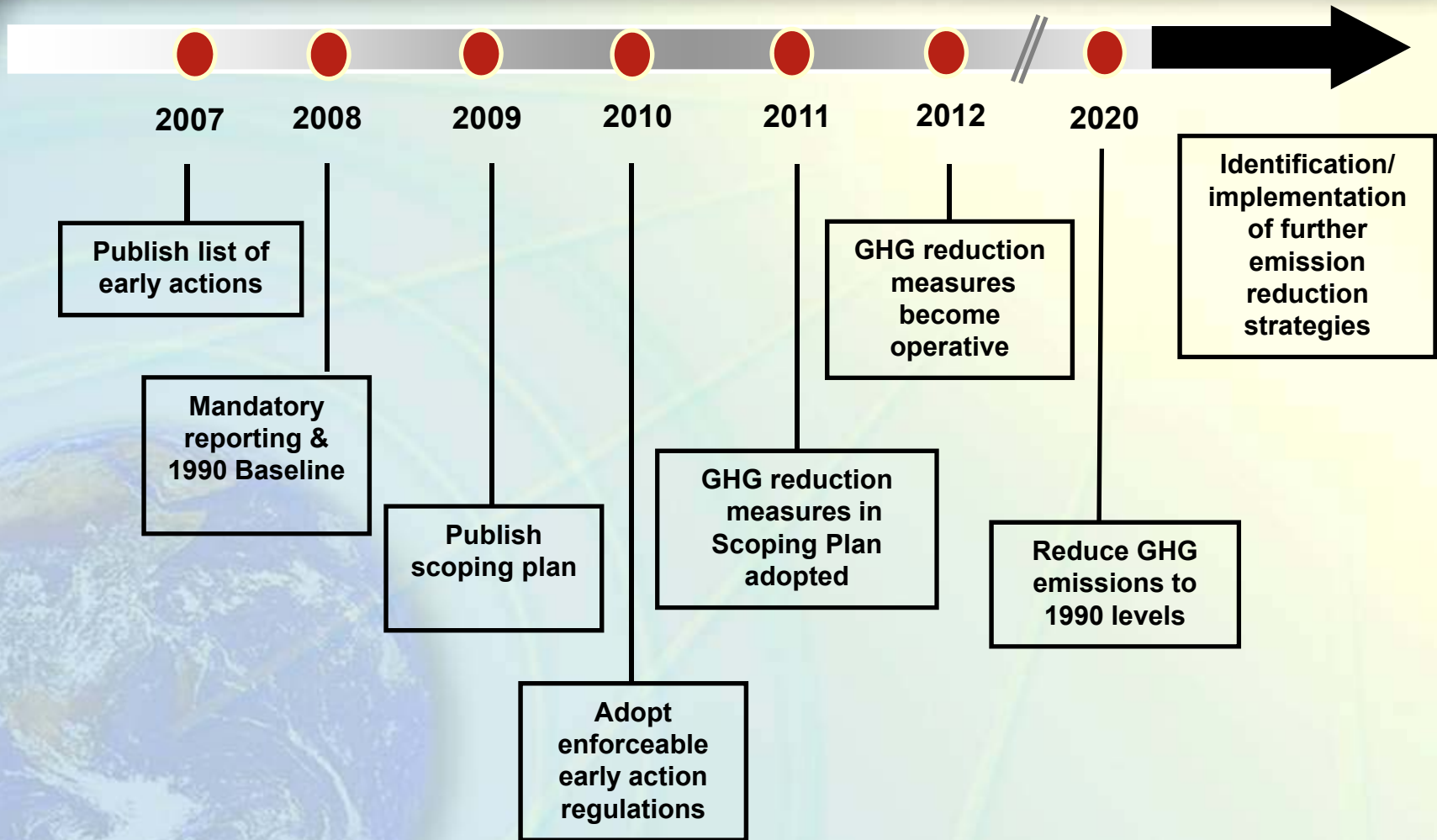


# Magnitude of the Challenge





# AB 32 Timeline



# Status of Scoping Plan

- Draft Plan released June 26, 2008
- *Proposed Scoping Plan* expected release on Oct. 3 for consideration at Nov. 20, 2008 Board Mtg.

# Scoping Plan Has Been a Participatory Process

- Contributions from Climate Action Team Subgroups
- Input from EJAC, ETAAC, and MAC
- Formal workshops & stakeholder work group meetings
- Public solicitation
- Extensive outreach at meetings, conferences and other events

# The California Model

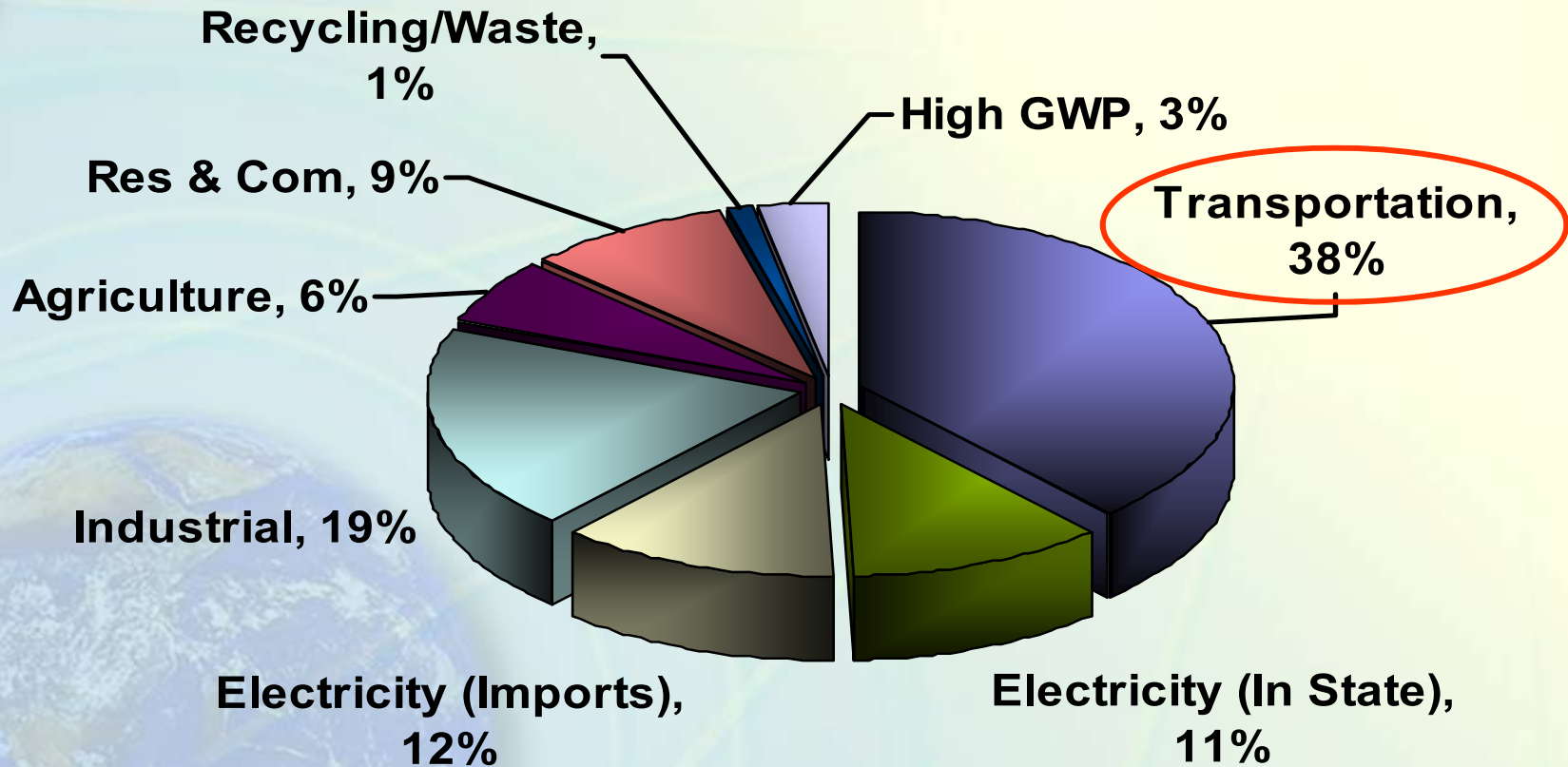
- Stimulate innovation in technology, behavior, institutions
- Target specific GHG reductions with broad array of rules and incentives
  - Energy efficiency stds, Renewables Portfolio Standard, Low Carbon Fuel Standard, etc
- Overlay cap-and-trade program (and offsets) to create price signal for carbon and to equilibrate costs across sectors (and gain additional reductions)
- Strong partnerships -- with governments, industry, and NGOs to motivate action by individuals/orgs
- Roughly proportional reductions across all sectors (initially)
- Leverage co-benefits
  - reduced oil use, public health, greater travel choices, urban livability, economic development

# California is Model and Leader, Not an “Island”

- Intent is not to create a unique, stand-alone set of policies and rules
- Intent is to encourage others to follow and to create rules and policies that are replicable and compatible with what others will do

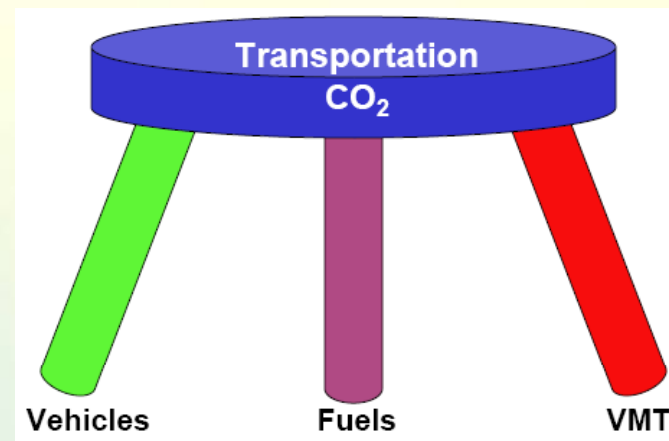


# 2002-2004 GHG Emissions (469 MMTCO<sub>2</sub>E)

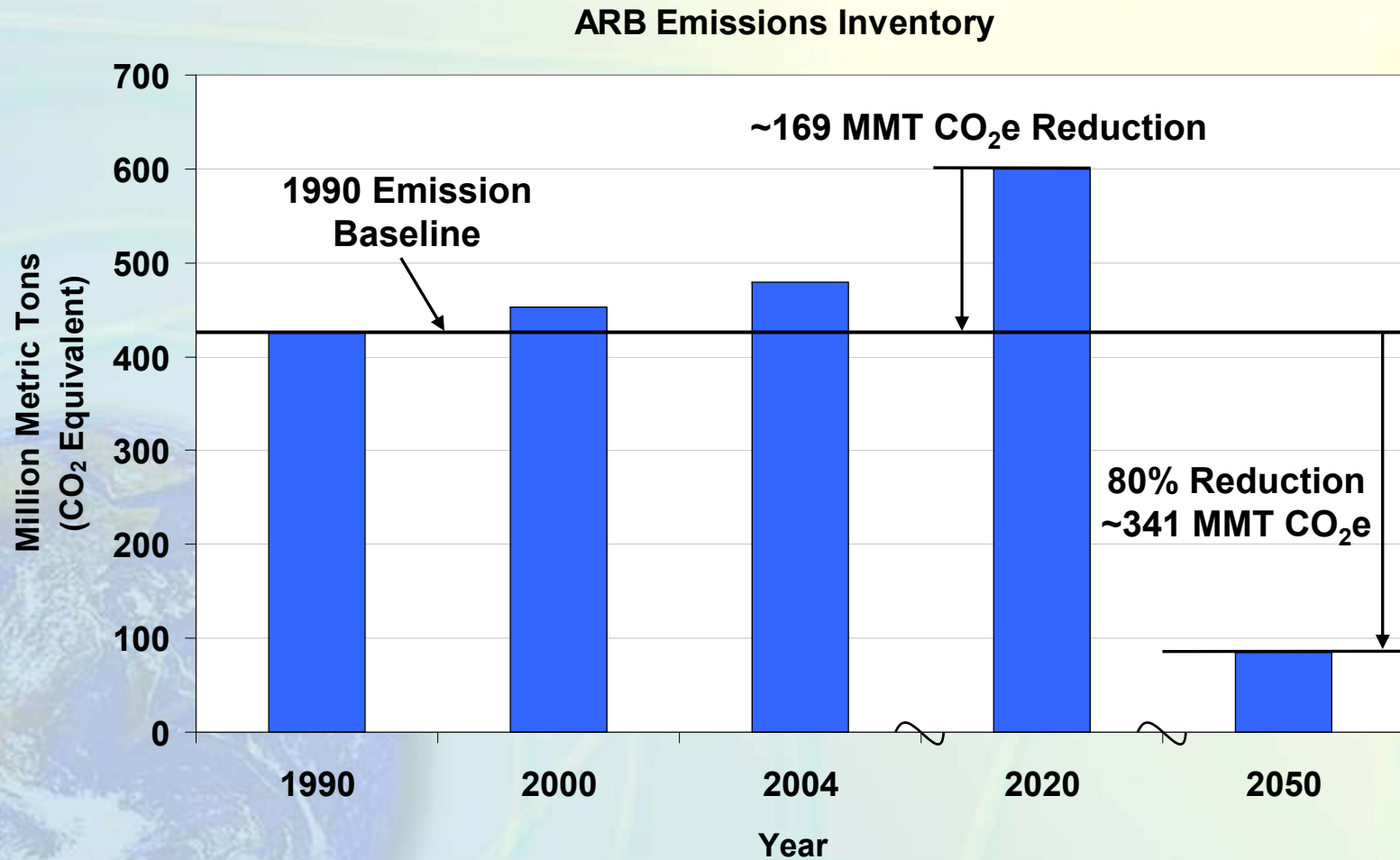


# Transportation in AB32

- Vehicles (cars and trucks) **39 MM tons**
  - Light-duty vehicle GHG reductions (Pavley I and II)
  - Other light duty vehicle efficiency measures
  - Feebates?
  - Truck Technology
    - Aerodynamic design
    - Improved efficiency for heavy duty trucks
    - Hybridization of urban and short-haul trucks
- Fuels **17 MM tons**
  - Low Carbon Fuel Standard
- VMT and goods movement **8 MM tons (↑)**
  - VMT reduction (SB375?) (including transit and land use changes)
  - High speed rail
  - Goods movement
  - Eco-driving: tire inflation, etc



# Magnitude of the Challenge



# I. Transforming Vehicles

*Cars of future will be far more efficient with far smaller carbon footprint, and will be powered mostly by electric-drive*



- AB32 Measures for Light Duty Vehicles
  - Pavley I: 30% reduction by 2016 (~37 mpg, plus reduced A/C refrigerants)
  - Pavley II: ~44 mpg in 2020 (equivalent to ~40 mpg in other 49 states) (note that EU is adopting standard of ~51 mpg in 2012 (120 g/km))
  - Misc vehicle efficiency measures such as tire inflation and efficiency
  - Feebates: if adopted would reduce the cost of achieving the reductions and if aggressive could achieve additional reductions
  - Aided by ZEV rules (to be streamlined and tightened in 2009/10)
- AB32 Measures for Medium and Heavy Duty Vehicles
  - Aerodynamic design
  - Improved efficiency for heavy duty trucks (APUs, lubricants, etc)
  - Hybridization of urban and short-haul trucks

## II. Transforming Fuels

*LCFS will accelerate the transition to alt fuels and transform the oil industry*

- Low carbon fuel standard requires 10% reduction in GHGs/unit of energy by 2020 (which implies a large proportion of low-carbon alt fuels)
- ZEV program supports use of electricity and hydrogen (not part of AB32)
- Future fuels will eventually be mix of biofuels, electricity and hydrogen

**Biofuels**



**Hydrogen**



**Electricity**





# III. Transforming Travel and Use of Vehicles

*Transforming mobility and the transportation system is a greater challenge than transforming vehicles and fuels*

- AB32 target of 2 MM tons for VMT will be increased
- Possible measures include SB375 (Steinberg) targets, changes in transport funding formulas, pay-as-you-go insurance, many local gov't actions, and many actions to improve goods movement
- Includes eco-driving (GIS/GPS aids for parking and route selection, fuel use info feedback, etc)
- Includes actions by local governments to reform land use
- Includes expanding traveler choice with smart paratransit, smart carpooling, tele-communications, NEVs,
- Goods movement improvements might include ship electrification at ports (early action), ship speeds, port trucks, harbor craft, and logistics



**For Additional Information:**





# TWO BILLION CARS

DRIVING TOWARD SUSTAINABILITY

DANIEL SPERLING & DEBORAH GORDON  
FOREWORD BY ARNOLD SCHWARZENEGGER

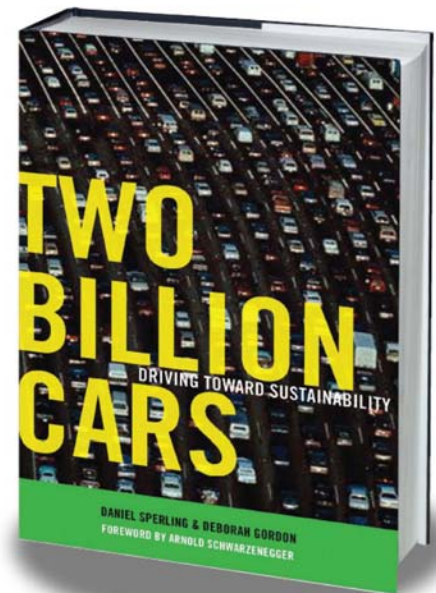
## Forthcoming from Oxford!

A new book by Daniel Sperling and Deborah Gordon  
with a foreword by Arnold Schwarzenegger

At present, there are roughly a billion vehicles in the world. Yet within twenty years, the number will double to 2 billion, largely a consequence of China's and India's explosive growth. Given that greenhouse gases are already creating havoc with our climate and that violent conflict in unstable oil-rich nations is on the rise, does this mean that matters will only get worse, or are there hopeful signs that effective, realistic solutions can be found?

In *Two Billion Cars*, through a concise history of America's love affair with cars and an overview of the global auto industry, leading transportation experts Daniel Sperling and Deborah Gordon explain how we arrived at this state, and what we can do about it. Sperling and Gordon outline the problem in full and identify its primary sources—the auto industry, short-sighted government policies, and consumers. They consider the issue from all angles and take up such topics as getting beyond the gas-guzzler monoculture, breaking Detroit's hold on energy and climate policy, the search for low-carbon fuels, California's pioneering role, and more. But they are not Cassandras. Promising advances in both transportation technology and fuel efficiency together with shifts in traveler behavior, they suggest, offer us a way out of our predicament.

Ultimately, the authors contend that the two places that have the most troublesome emissions problems—California and China—are especially active in developing novel solutions that offer a path forward. Arnold Schwarzenegger's enlightened embrace of eco-friendly fuel policies, which he discusses in the foreword to *Two Billion Cars*, and China's forthright recognition that it needs far-reaching environmental and energy policies, suggest that if they can tackle the issue effectively and honestly, then there really is reason for hope.



January 2009 320 pp.; 33 b/w illus.  
978-0-19-537664-7 cloth \$24.95

**Daniel Sperling** is Professor of Engineering and Environmental Science & Policy at the University of California, Davis, and Founding Director of University of California, Davis's Institute of Transportation Studies. He also serves on the California Air Resources Board, chairs the Future of Mobility Council of the Davos World Economic Forum, and has authored 10 books and over 200 technical papers and reports on transportation and energy.

**Deborah Gordon** is a senior transportation policy analyst who has provided consulting services to the National Commission on Energy Policy, the California Energy Commission, Hewlett Foundation, and the Chinese government to develop fiscal policies for their burgeoning auto fleet. She earlier served as director of transportation and energy programs at the Union of Concerned Scientists, senior research scholar at the Yale School of Forestry and Environmental Studies, and a chemical engineer at Chevron.

Available January 2009  
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## For Additional Information:

- ARB Climate Change Web Site  
(*To stay informed - sign up for list serve*)  
[www.arb.ca.gov/cc/cc.htm](http://www.arb.ca.gov/cc/cc.htm)
- California Climate Change Portal  
[www.climatechange.ca.gov](http://www.climatechange.ca.gov)
- Comments on the Draft Scoping Plan  
[www.arb.ca.gov/cc/scopingplan/spcomment.htm](http://www.arb.ca.gov/cc/scopingplan/spcomment.htm)